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(54) Title: IMPROVED CHEWING GUM AND CANDY PRODUCTS (57) Abstract Confections that contain coffee or tea are provided. By providing such compositions, the resultant confection compositions provide a real, full body coffee or tea flavor to the consumer. Additionally, in an embodiment, the compositions provide the consumer with a source of caffeine. If desired, decaffeinated coffee or tea can be utilized to provide the tea or coffee taste without a dose of caffeine.		

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S P E C I F I C A T I O NTITLE

IMPROVED CHEWING GUM AND CANDY PRODUCTS

BACKGROUND OF THE INVENTION

5 The present invention relates generally to confectionary products, such as chewing gums and candies. More specifically, the present invention relates to confectionary products having specific flavors and additives.

10 It is of course known to provide confectionary products such as chewing gums and candies with a variety of flavors and characteristics. For example, chewing gum can include flavoring agents, such as: citrus oils; fruit essence; peppermint oil; spearmint oil; clove oil;
15 wintergreen oil; anise; and the like. Additionally, it is known to use artificial flavoring agents to provide other flavors to the chewing gum.

 In a similar vein, it is known to provide candy products, for example, hard candies, with a variety of
20 different flavors. Similar to chewing gums, natural and artificial flavoring agents can be used in the candy products.

 The use of artificial flavors allows confectionary products to exhibit, or mimic, a variety of different
25 flavors. For example, it is known to provide a coffee taste by providing an artificial coffee flavor.

 In a number of countries outside of the United States, confections that include the chemical caffeine (3,7-Dihydro-1,3,7-trimethyl-1H-purine-2,6-dione) as an
30 ingredient are quite popular. Caffeine is provided in these products as a chemical entity and not as component of some other agent or compound.

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5 However, in the United States, as well as some other
countries, regulations may prohibit the addition of the
chemical entity caffeine to a candy or gum product. For
example, the FDA prohibits the use of the chemical entity
caffeine in tablets other than those classified as a
10 drug. It is believed by many in the industry, that in
order to use the chemical entity caffeine as an
ingredient in a gum or candy type delivery system, the
product may be required to be classified as a
15 prescription drug or an over-the-counter drug.

SUMMARY OF THE INVENTION

15 The present invention provides a confectionary
product, that includes either coffee or tea. This
creates a product that provides the user with a coffee
or tea taste flavor. Unlike artificial coffee flavored
confections, the product will produce a delicious, full
flavored taste sensation to the consumer that is very
similar, if not identical, to that produced by a cup of
coffee or tea.

20 Still further, the product will provide a source of
caffeine to the consumer without the requirement of the
product being dispensed as a drug. In this regard,
because caffeine is not being provided alone as a
chemical entity, but rather, caffeine is included as a
25 component of a natural product it is believed that FDA
requirements of drug labeling will not be required.

30 To this end, in an embodiment, a confectionary
product is provided comprising at least one agent chosen
from the group consisting of tea, coffee beans, instant
tea, and instant coffee.

 The confectionary product can be any confection.
For example, the confectionary product can be a chewing
gum, a hard candy, or a chewy candy. Preferably, the

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agent is present in an amount comprising at least approximately 0.1% by weight of the confection.

5 In an embodiment, a chewing gum composition is provided. The chewing gum composition includes a water insoluble base portion and a water soluble portion. The chewing gum composition includes at least one agent chosen from the group consisting of tea, instant tea, coffee beans, and instant coffee.

10 In an embodiment, the chewing gum includes the agent in an amount of at least approximately 1% by weight of the chewing gum.

A variety of different chewing gums can be utilized. For example, in an embodiment, the chewing gum includes sugar. In an embodiment, the chewing gum is substantially wax free. In an embodiment, the chewing gum is a low calorie chewing gum.

15 Still further, the chewing gum can include a variety of agents. For example, the chewing gum can include agents that provide dental benefits.

20 If desired, the coffee or tea in the confectionary product can be caffeine free.

Methods of preparing chewing gum compositions as well as candy products are also provided. For example, the present invention provides a method of preparing a chewing gum composition comprising the steps of preparing a water insoluble gum base. To the water insoluble gum base is added a water soluble portion. Then, at least one agent chosen from the group consisting of instant tea, tea, coffee beans, and instant coffee is added to the mixture.

30 In an embodiment, the agent is in the form of a powder. For example, the agent can be instant coffee or tea powder.

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An advantage of the present invention is to provide an improved confectionary product.

Furthermore, an advantage of the present invention is to provide an improved chewing gum composition.

5 Still further, an advantage of the present invention is to provide a confection product containing caffeine that does not have to be classified as a drug.

Moreover, an advantage of the present invention is to provide a confection that provides a full flavored
10 coffee or tea taste.

An additional advantage of the present invention is to provide a candy or chewing gum product that does not require artificial flavors to provide a coffee or tea taste.

15 Additional features and advantages of the present invention are described in, and will be apparent from, the detailed description of the presently preferred embodiments.

DETAILED DESCRIPTION

20 OF THE PRESENTLY PREFERRED EMBODIMENTS

The present invention provides improved confectionary products. As used herein, the terms "confectionary product(s)" and "confection(s)" are broadly used and refer to candies, including hard and
25 chewy candy, chewing gums, and like products.

As set forth in detail hereinafter, the present invention provides confections that contain coffee or tea. By providing such compositions, the resultant confection compositions provide a real, full bodied
30 coffee or tea flavor to the consumer. Additionally, in an embodiment, the compositions provide the consumer with a source of caffeine. Of course, if desired,

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decaffeinated coffee or tea can be utilized to provide the tea or coffee taste without a dose of caffeine.

Pursuant to the present invention, the coffee or tea is incorporated in the confection. As noted below, a
5 variety of different agents that can be classified as coffee or tea can be utilized. For example, "real" coffee from coffee beans can be utilized. However, it is possible to utilize instant coffee which comprises coffee beans that are dried, for example, through a
10 lyophilization process. In a similar vein, pulverized tea leaves can be utilized. However, instant tea can also be utilized pursuant to the present invention.

Contrary to what would be expected, it has been found that ground tea leaves and coffee beans can be
15 processed into chewing gum and candies. Still further, with respect to chewing gum, because the body or structure of the tea or coffee product remains in the insoluble base portion (cud) of the chewing gum during the chew, a variety of different tea and coffee
20 formulations and constructions can be used without providing the consumer with a mouthful of coffee grounds.

Referring now to chewing gum, pursuant to the present invention, the chewing gum including tea or coffee may be based on a variety of different chewing
25 gums that are known. For example, the chewing gums can be low or high moisture, sugar or sugarless, wax containing or wax free, low calorie (via high base or low calorie bulking agents), and/or may contain dental agents.

30 Chewing gum generally consists of a water insoluble gum base, a water soluble portion, and flavors. The water soluble portion dissipates with a portion of the flavor over a period of time during chewing. The gum

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base portion is retained in the mouth throughout the chew.

5 The insoluble gum base generally comprises elastomers, resins, fats and oils, softeners, and inorganic fillers. The gum base may or may not include wax. The insoluble gum base can constitute approximately 5 to about 95 percent, by weight, of the chewing gum, more commonly, the gum base comprises 10 to about 50 percent of the gum, and in some preferred embodiments, 10 20 to about 35 percent, by weight, of the chewing gum.

15 In an embodiment, the chewing gum base of the present invention contains about 20 to about 60 weight percent synthetic elastomer, 0 to about 30 weight percent natural elastomer, about 5 to about 55 weight percent elastomer plasticizer, about 4 to about 35 weight percent filler, about 5 to about 35 weight percent softener, and optional minor amounts (about one percent or less) of miscellaneous ingredients such as colorants, antioxidants, etc.

20 Synthetic elastomers may include, but are not limited to, polyisobutylene with GPC weight average molecular weight of about 10,000 to about 95,000, isobutylene-isoprene copolymer (butyl elastomer), styrene-butadiene copolymers having styrene-butadiene ratios of about 1:3 to about 3:1, polyvinyl acetate 25 having GPC weight average molecular weight of about 2,000 to about 90,000, polyisoprene, polyethylene, vinyl acetate-vinyl laurate copolymer having vinyl laurate content of about 5 to about 50 percent by weight of the copolymer, and combinations thereof. 30

Preferred ranges are, for polyisobutylene, 50,000 to 80,000 GPC weight average molecular weight, for styrene-butadiene, 1:1 to 1:3 bound styrene-butadiene,

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for polyvinyl acetate, 10,000 to 65,000 GPC weight average molecular weight with the higher molecular weight polyvinyl acetates typically used in bubble gum base, and for vinyl acetate-vinyl laurate, vinyl laurate content of 10-45 percent.

Natural elastomers may include natural rubber such as smoked or liquid latex and guayule as well as natural gums such as jelutong, lechi caspi, perillo, sorva, massaranduba balata, massaranduba chocolate, nispero, rosindinha, chicle, gutta hang kang, and combinations thereof. The preferred synthetic elastomer and natural elastomer concentrations vary depending on whether the chewing gum in which the base is used is adhesive or conventional, bubble gum or regular gum, as discussed below. Preferred natural elastomers include jelutong, chicle, sorva and massaranduba balata.

Elastomer plasticizers may include, but are not limited to, natural rosin esters such as glycerol esters of partially hydrogenated rosin, glycerol esters of polymerized rosin, glycerol esters of partially dimerized rosin, glycerol esters of rosin, pentaerythritol esters of partially hydrogenated rosin, methyl and partially hydrogenated methyl esters of rosin, pentaerythritol esters of rosin; synthetics such as terpene resins derived from alpha-pinene, beta-pinene, and/or d-limonene; and any suitable combinations of the foregoing. the preferred elastomer plasticizers will also vary depending on the specific application, and on the type of elastomer which is used.

Fillers/texturizers may include magnesium and calcium carbonate, ground limestone, silicate types such as magnesium and aluminum silicate, clay, alumina, talc, titanium oxide, mono-, di- and tri-calcium phosphate,

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cellulose polymers, such as wood, and combinations thereof.

Softeners/emulsifiers may include tallow, hydrogenated tallow, hydrogenated and partially hydrogenated vegetable oils, cocoa butter, glycerol monostearate, glycerol triacetate, lecithin, mono-, di- and triglycerides, acetylated monoglycerides, fatty acids (e.g. stearic, palmitic, oleic and linoleic acids), and combinations thereof.

Colorants and whiteners may include FD&C-type dyes and lakes, fruit and vegetable extracts, titanium dioxide, and combinations thereof.

The base may or may not include wax. An example of a wax-free gum base is disclosed in U.S. Serial No. 07/906,921, the disclosure of which is incorporated herein by reference.

In addition to a water insoluble gum base portion, a typical chewing gum composition includes a water soluble bulk portion and one or more flavoring agents. The water soluble portion can include bulk sweeteners, high intensity sweeteners, flavoring agents, softeners, emulsifiers, colors, acidulants, fillers, antioxidants, and other components that provide desired attributes.

Softeners are added to the chewing gum in order to optimize the chewability and mouth feel of the gum. The softeners, which are also known as plasticizers and plasticizing agents, generally constitute between approximately 0.5 to about 15% by weight of the chewing gum. The softeners may include glycerin, lecithin, and combinations thereof. Aqueous sweetener solutions such as those containing sorbitol, hydrogenated starch hydrolysates, corn syrup and combinations thereof, may

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also be used as softeners and binding agents in chewing gum.

Bulk sweeteners include both sugar and sugarless components. Bulk sweeteners typically constitute 5 to
5 about 95% by weight of the chewing gum, more typically, 20 to 80% by weight, and more commonly, 30 to 60% by weight of the gum.

Sugar sweeteners generally include saccharide-containing components commonly known in the chewing gum
10 art, including, but not limited to, sucrose, dextrose, maltose, dextrin, dried invert sugar, fructose, levulose, galactose, corn syrup solids, and the like, alone or in combination.

Sugarless sweeteners include, but are not limited
15 to, sugar alcohols such as sorbitol, mannitol, xylitol, hydrogenated starch hydrolysates, maltitol, and the like, alone or in combination.

High intensity artificial sweeteners can also be used, alone or in combination with the above. Preferred
20 sweeteners include, but are not limited to sucralose, aspartame, salts of acesulfame, alitame, saccharin and its salts, cyclamic acid and its salts, glycyrrhizin, dihydrochalcones, thaumatin, monellin, and the like, alone or in combination. In order to provide longer
25 lasting sweetness and flavor perception, it may be desirable to encapsulate or otherwise control the release of at least a portion of the artificial sweetener. Such techniques as wet granulation, wax granulation, spray drying, spray chilling, fluid bed coating, coacervation,
30 and fiber extension may be used to achieve the desired release characteristics.

Usage level of the artificial sweetener will vary greatly and will depend on such factors as potency of the

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sweetener, rate of release, desired sweetness of the product, level and type of flavor used and cost considerations. Thus, the active level of artificial sweetener may vary from 0.02 to about 8%. When carriers
5 used for encapsulation are included, the usage level of the encapsulated sweetener will be proportionately higher.

Combinations of sugar and/or sugarless sweeteners may be used in chewing gum. Additionally, the softener
10 may also provide additional sweetness such as with aqueous sugar or alditol solutions.

If a low calorie gum is desired, a low caloric bulking agent can be used. Example of low caloric bulking agents include: polydextrose; Raftilose,
15 Raftilin; Fructooligosaccharides (NutraFlora); Palatinose oligosaccharide; Guar Gum Hydrolysate (Sun Fiber); or indigestible dextrin (Fibersol). However, other low calorie bulking agents can be used.

A variety of flavoring agents can be used, if
20 desired. The flavor can be used in amounts of approximately 0.1 to about 15 weight percent of the gum, and preferably, 0.2 to 5%. Flavoring agents may include essential oils, synthetic flavors or mixtures thereof including, but not limited to, oils derived from plants
25 and fruits such as citrus oils, fruit essences, peppermint oil, spearmint oil, other mint oils, clove oil, oil of wintergreen, anise and the like. Artificial flavoring agents and components may also be used. Natural and artificial flavoring agents may be combined
30 in any sensorially acceptable fashion.

Pursuant to the present invention, coffee or tea is added to the chewing gum composition. In an embodiment, the coffee or tea component will comprise at least 1% by

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weight percent of the chewing gum. In a preferred embodiment, the coffee or tea component comprises approximately 1% to about 40% by weight of the chewing gum composition. When instant coffee, or tea, is used in a preferred embodiment, it will comprise approximately 1 to about 25 weight %. When regular coffee, or tea, is used, in a preferred embodiment, it will comprise approximately 5 to about 40 weight %.

By way of example, and not limitation, the chewing gums can have the following construction: approximately 7 to about 9 weight % corn syrup; approximately 65 to about 70 weight % sugar; approximately 17 to about 22 weight % gum base; approximately 2.5 to about 4.0 weight % glycerine; approximately 0.1 to about 0.9 weight % lecithin; approximately 0.5 to about .75 weight % artificial flavors; and approximately 1 to about 40 weight % pulverized coffee beans or tea leaves.

Of course, instant coffee or tea can also be used, if desired. Likewise, as noted above, other components can be used such as artificial sweeteners.

By way of example, and not limitation, two examples of the chewing gum of the present invention are as follows:

	<u>Example 1</u>	<u>Example 2</u>
25 Corn Syrup	8.0	8.0
Sugar	52.2	52.2
Gum Base	19.5	19.5
Glycerine	3.1	3.1
Lecithin	0.5	0.5
30 Artificial Flavors	0.65	0.65
Powdered Tea Leaves	15%	0.0
Pulverized Coffee Beans	0.0	15%

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Chewing gum is generally manufactured by sequentially adding the various chewing gum ingredients to any commercially available mixer known in the art. After the ingredients have been thoroughly mixed, the gum mass is discharged from the mixer and shaped into the desired form such as by rolling into sheets, scoring and cutting into sticks. Generally, the ingredients are mixed by first melting the gum base and adding it to the running mixer. The gum base may alternatively be melted in the mixer. Color and emulsifiers can be added at this time.

A softener such as glycerin can be added next along with syrup and part of the bulk portion. Further, parts of the bulk portion may then be added to the mixer. Flavoring agents are typically added with the final part of the bulk portion. Pursuant to the present invention, coffee and/or tea is added to the mixture. The coffee or tea can either be "real" coffee or tea or instant coffee or tea. The entire mixing process typically takes from five to fifteen minutes although longer mixing times are sometimes required. Those skilled in the art will recognize that variations of this mixing procedure, or other mixing procedures, may be followed.

With respect to other confections, such as candies, a variety of different products are possible. The present invention can be used to create hard candy or chewy candy.

For example, as a hard candy, the composition could include: sugar; corn syrup; water; and coffee or tea. Flavors, artificial or natural, can also be added. Of course, artificial sweeteners such as those noted above with respect to chewing gum can be used. Additional ingredients known in the art to be used in hard candy can

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also be used. In an embodiment, the hard candy comprises at least 0.1% by weight tea, coffee, instant tea, or instant coffee. Preferably, instant tea or coffee is used.

5 By way of example, and not limitation, the hard candy can comprise: approximately 31 to about 55 weight % sugar; approximately 30 to about 60 weight % corn syrup; approximately 8 to about 12 weight % water; 0 to about 1.5 weight % citric acid; approximately 0.3 to
10 about 0.9 weight % artificial or natural flavor; and 0.1 to about 10 weight % instant tea or coffee.

By way of example, and not limitation, two examples of hard candies of the present invention are as follows:

	<u>Example 3</u>	<u>Example 4</u>
15 Sugar	51.80	51.80
Corn Syrup	34.90	34.90
Water	11.25	11.25
Citric Acid	0.90	0.90
Artificial Flavor	0.70	0.70
20 Instant Tea	0.45	0.00
Instant Coffee	0.00	0.45

There are a variety of methods that can be used for constructing the hard candy. For example, a processing method for hard candy using instant tea can include a
25 conventional Uniplas method that is modified to produce the hard candy of the present invention. The glucose/sugar mixture is concentrated into the thick, molten candy mass, after which a concentrated solution of instant tea and flavor is conventionally folded into
30 it. This is followed by the normal forming, cooling, and wrapping techniques of the viscous, hard candy mass.

Likewise, a conventional Uniplas method of producing hard candy can be modified to produce the hard candy with

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instant coffee. The glucose/sugar mixture being concentrated into a thick, molten candy mass, after which a concentrated solution of instant coffee and flavor is conventionally folded into it. This is followed by the normal forming, cooling, and wrapping techniques of the viscous, hard candy mass.

As a chewy candy, the composition can, for example, include: corn syrup; sugar; lecithin; glyceryl monostearate; water shortening; and coffee or tea. Other ingredients, such as NFDM, salt, and natural and artificial flavors, can be included. Likewise, artificial sweeteners such as those noted above with respect to chewing gum can be used. Of course, other ingredients used in the art can be included. In an embodiment, the chewy candy comprises at least 1.0% by weight coffee or tea.

By way of example, and not limitation, the chewy candy can comprise: approximately 40 to about 60 weight % corn syrup; approximately 35 to about 50 weight % sugar; approximately 0.4 to about 1.2 weight % lecithin; approximately 1.0 to about 3.0 weight % glyceryl monostearate; 0 to about 5 weight % NFDM; 2 to 3 weight % water; 0 to about 0.35 weight % salt; approximately 4.0 to about 7.0 weight % shortening (in an embodiment, Durkee's Hydrol 100); 0 to about 1.5 weight % artificial or natural flavor; approximately 1.0 to about 10 weight % instant coffee or tea; and approximately 1 to about 2.5 water for dissolving the coffee or tea.

By way of example, and not limitation, two examples of a chewy candy pursuant to the present invention will now be given.

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		<u>Example 5</u>	<u>Example 6</u>
	Corn Syrup	43.0	43.0
	Sugar	38.5	38.5
	Lecithin	0.8	0.8
5	Glyceryl Monostearate	2.1	2.1
	NFDM	3.0	3.0
	Water	2.5	2.5
	Salt	0.2	0.2
	Shortening (Durkee's		
10	Hydrol 110)	5.6	5.6
	Artificial Flavors	1.0	1.0
	Instant Coffee	2.3	0.0
	Instant Tea	0.0	2.3
	Water (For Dissolving Instant		
15	Coffee or Tea)	1.0	1.0

20 A number of methods can be used to make the chewy candy formula. Conventional single blade mixers can be used. All the ingredients are blended together and two-thirds of the way through the blending process, the powdered tea is disseminated evenly over the mixing candy mass until homogenous results are achieved. The thoroughly mixed mass can then be formed in a variety of ways into sticks, chunks, or pieces, and twist-wrapped, stick-wrapper, or bar-wrapped as desired.

25 Specifically, an example of the method is as follows. Corn syrup, sugar, lecithin, NFDM, 1st water, salt, and shortening is cooked to 265°F in a steam jacketed kettle with constant agitation. The steam is turned off. A continue agitation is maintained while
30 circulating cool water. The temperature is brought down to 225°F. The instant coffee or tea is predissolved in 2nd water. The solution (slurry) of tea or coffee is

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added along with the flavors. The resultant mixture is blended thoroughly.

5 The fluid candy is deposited into tubs and cured for 24 hours. Batch rollers and rope formers or any other standard equipment can then be used in the manufacture of soft candies.

10 It should be understood that various changes and modifications to the presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications can be made without departing from the spirit and scope of the present invention and without diminishing its attendant advantages. It is therefore intended that such changes and modifications be covered by the appended claims.

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WE CLAIM:

1. A confectionary product comprising:
a sweetener; and
at least one agent chosen from the group consisting
5 of tea, coffee beans, instant tea, and instant coffee,
the agent comprising at least 5% by weight of the
confectionary product.
2. The confectionary product of Claim 1 wherein
the sweetener is sugar.
- 10 3. The confectionary product of Claim 1 wherein
the sweetener is an artificial sweetener.
4. The confectionary product of Claim 1 wherein
the confectionary product is hard candy.
- 15 5. The confectionary product of Claim 1 wherein
the confectionary product is chewy candy.
6. A chewing gum comprising:
a water insoluble base portion;
a water soluble portion; and
an agent chosen from the group consisting of tea,
20 coffee beans, instant tea, and instant coffee, the agent
comprising at least 5% by weight of the chewing gum.
7. The chewing gum of Claim 6 wherein the agent
is in the form of a powder.
8. The chewing gum of Claim 6 wherein the chewing
25 gum includes sugar.
9. The chewing gum of Claim 6 wherein the chewing
gum is substantially wax free.
10. The chewing gum of Claim 6 wherein the chewing
gum is a low calorie chewing gum.
- 30 11. The chewing gum of Claim 6 including a
therapeutically effective amount of an agent having
dental benefits.

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12. The chewing gum of Claim 6 wherein the chewing gum does not include caffeine.

13. A method for preparing a chewing gum composition comprising the steps of:

5 preparing a water insoluble gum base;

adding to the gum base, a water soluble portion; and

adding an agent chosen from the group consisting of instant coffee, instant tea, tea, and coffee to the gum base and water soluble portion, the agent comprising at least 5% by weight of the chewing gum composition.

10 14. The method of Claim 13 wherein the agent is powdered.

15 15. The method of Claim 13 wherein the agent contains caffeine.

16. A method for preparing a candy product comprising the steps of:

preparing a molten candy mass; and

adding thereto an agent chosen from the group consisting of coffee, instant coffee, tea, and instant tea, the agent comprising at least 5% by weight of the candy.

17. A candy comprising:

a candy base; and

at least one agent chosen from the group consisting of instant coffee, instant tea, coffee, and tea, the agent comprising at least 5% by weight of the candy.

18. The candy of Claim 17 wherein the candy is hard candy.

19. The candy of Claim 17 wherein the candy is chewy candy.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US94/07021

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) :A23G 3/00

US CL :426/3, 660

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 426/3, 4, 5, 6, 594, 660

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
CONFECTIONERY TEXTS

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS AND JPOS

chewing gum ,coffee, tea, instant,coffee bean

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 3,826,847 (OGAWA ET AL) 30 July 1974, see entire document.	1-19
Y	CN, A,1060012 (ZHAO-YI) 08 APRIL 1992, see entire document.	1-19
Y	ROTH, J., Old Fashioned Candymaking, Henry Regnery Company, Chicago, 1974, pages 39,85-86.	1-19

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	*T	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be part of particular relevance	*X*	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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Date of the actual completion of the international search

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